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Renewed Petition under 37 CFR 1.137(b)

Serial No:	10/805,200
Filed:	03/22/2004
Applicant:	Carl O. Olsson
Application Title:	Apparatus and Method for Regulating Electric Power

Mail Stop Petition
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner,

Applicant respectfully requests the revival of the above-identified patent application on the grounds of unintentional delay pursuant to 37 CFR 1.137(b). Referring to the explanation in Office Action mailed on September 17, 2007 Applicant now understands that the delay to respond to Office Action dated June 1, 2006 was unintentional rather than unavoidable. The unintentional delay was due to the lack of experience of Applicant in interpreting the regulations and not due to the intervention of unforeseen circumstances or negligence of third parties.

This petition is accompanied by

1. A check in the amount of $ 770.00
2. 7 pages Amendment B including Certificate of Mailing

Sincerely

Carl O. Olsson
Applicant

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No:	10/805,200
Filed:	03/22/2004
Applicants:	Carl O. Olsson and Richard Redl
Application Title:	Apparatus and Method for Regulating Electric Power
Examiner:	Berhane, Adolf D
Art Unit:	2838

Assistant Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

AMENDMENT B

Sir:

In response to the Office Actions mailed 02/21/2006 and 06/01/2006 kindly amend the above-identified patent application as follows.

CLAIM AMENDMENTS

Claim 1 (currently amended): A power supply connected to an AC, Alternating Current, power source of arbitrary waveform comprising [[: a.]] an essentially loss free impedance in series with [[b.]] a controllable essentially loss free electronic device with means to both sink and source AC current of an arbitrary waveform, [[c.]] means of controlling said electronic device, and [[d.]] a load connected in parallel with said electronic device whereby the power supplied to said load is regulated as desired.

Claim 2 (previously presented): A power supply as recited in claim 1 in which the essentially loss free impedance is an inductor.

Claim 3 (cancelled)

Claim 4 (previously presented): A power supply as recited in claim 2 comprising a transformer connected to the mains and said inductor included in its primary or secondary circuits or both, or said inductor consisting of a considerable leakage inductance between the primary and at least one secondary, said load being distributed between said secondaries as needed.

Claim 5 (previously presented): A power supply as recited in claim 4 in which the voltage from at least one secondary is rectified by controllable valves and the charge stored in a capacitor, said valves being turned on and off by timing signals from an analog control circuit or a microprocessor so that said secondary performs as said essentially loss free electronic device being able to both sink and source current whereby the control circuit regulates the AC voltage across said secondary within a wide range.

Claim 6 (previously presented): A power supply as recited in claim 5 in which a load is also connected in parallel with said capacitor, and in which the DC, Direct Current, voltage across said capacitor and the current to said load are compared to DC reference voltages and regulated by feed back means whereby regulated and adjustable DC voltage and current from zero to maximum is available and AC regulated and adjustable voltage and current from a low value to maximum is available and the respective proportions of DC and AC power selectable as needed.

Claim 7 (previously presented): A power supply as recited in claim 6 in which the transformer has a plurality of secondaries, some intended for AC and some to provide DC whereby one DC unit is providing regulation and adjustment causing the others to follow and be regulated and adjusted as well.

Claim 8 (previously presented): A power supply as recited in claim 7 in which the controllable valves are mosfets with their switching speed reduced whereby a minimum of noise is caused.

Claim 9 (previously presented): A power supply as recited in claim 8 in which the timing sinusoidal signal is reduced to a semi square wave and integrated an even number of times to obtain a delay of 180 degrees or a multiple thereof whereby a resulting timing signal will be less influenced by noise from the mains.

Claim 10 (previously presented): A power supply as recited in claim 9 in which the resulting time signal has means to create a positive rising waveform comprising approximately 180 degrees and a mirrorlike falling waveform comprising the following 180 degrees so that two timing pulses are available during each cycle.

Claim 11 (previously presented): A power supply as recited in claim 10 which has means to limit the timing delay to the first 90 degrees of each half cycle.

Claim 12 (previously presented): A power supply as recited in claim 11 with means to further limit the range of delay whereby safeguarding against a too low mains voltage.

Claim 13 (previously presented): A power supply as recited in claim 12 having means to detect and eliminate down to an acceptable level DC current in the transformer windings whereby preventing saturation of the transformer and destruction of the power supply.

Claim 14 (previously presented): A power supply as recited in claim 13 adapted to uninterruptible service by including an oscillator with slightly lower frequency than the mains, a first fast switch to connect and disconnect the mains, a second fast switch to connect and disconnect a battery or other standby power source, and means to operate said switches at the correct times whereby the power supply will automatically switch to standby power in the event of a mains failure and go back to normal operation when the mains returns, the DC voltage from said capacitor being used to recharge the battery if any.

Claim 15 (previously presented): A power supply as recited in claim 14 in which four mosfets are used in a bridge whereby the voltage across each mosfet is limited to essentially the DC output voltage.

Claim 16 (previously presented): A power supply as recited in claim 15 in which two mosfets are used in a push pull configuration whereby the AC and DC outputs can use the same system ground and the voltage across each mosfet is approximately double the DC voltage.

Claim 17 (currently amended): A method of regulating an AC voltage comprising the steps of: [[a.]] supplying an AC utility power having a line frequency; [[b.]] connecting it to a load in series with an inductor; [[c.]] connecting a controllable device in parallel with the load said controllable device being able to essentially loss-free sink and source current; [[d.]] connecting a controller to said controllable device said controller steering the phase and amplitude of the current from and to the controllable device whereby the voltage across the load can be adjusted and regulated.

Claim 18 (previously presented): A method of regulating a DC voltage as described in claim 17, wherein said voltage across the regulating device is rectified by mosfet rectifiers and is charging a capacitor in parallel with the load, said controller to be using feed back methods and turning on and turning off the mosfets so that said capacitor is sourcing or sinking current whereby the DC voltage across the capacitor is being controlled and regulated.

Claim 19 (previously presented): A method as described in claim 18 supplying simultaneously both regulated and controlled AC and DC

Claim 20 (previously presented): A method as described in claim 19 wherein said capacitor is connected with a battery or other DC supply through a mosfet transistor, said controller including an oscillator normally synchronized with the mains but having a slightly lower

natural frequency than the mains and driving the mosfet rectifiers also when the mains has dropped out and using the power from the battery or other DC supply whereby the operation is continuing uninterrupted.

Claim 21 (new): A power supply as recited in claim 1, said load being able to both sink and source power.

REMARKS

Claim Rejection Over 35 USC § 102

Claims 1-5 and 17 were rejected as being anticipated by Voigt et al. (4,092,709). Voigt discloses a self-oscillating converter regulator power supply that operates from a DC source of power typically obtained by rectifying an AC power source, and includes among others a loss free impedance (12), filter capacitor (16), transformer (52), electronic device (68), rectifier (30), loads connected to a plurality of output windings (202, 216, 226, 234) and output capacitors (210, 224, 232, 242, etc.) across the loads.

Applicants respectfully point out that there are fundamental differences between the power supply disclosed by Voigt and the power supply claimed by applicants, including the function and implementation of some of the above-mentioned elements of the Voigt patent as compared to the corresponding elements of applicants' power supply, and also the principle of operation.

The loss free impedance (12) in the Voigt patent is a winding of the filter transformer (10) [see col. 2, line 48]. The filter transformer is not discussed in the patent but it is known to those skilled in the art that the purpose of that device is to prevent the pollution of the AC power source by the switching noise of the blocking oscillator. The filter transformer is not a functionally essential part of the Voigt invention. In contrast, the purpose of the loss free impedance (101, an inductor) or (102, a capacitor) in applicants' invention is to make possible the regulation of the output voltage by changing the phase of the square wave (164) generated by the regulating mosfet bridge (105). That loss free impedance is a fundamental part of applicants' invention, as shown in Figures 1A and 1B.

The purpose of the filter capacitor (16) in the Voigt patent is similar to that of the loss free impedance (12) of the same patent, i.e., preventing the pollution of the AC power source by the switching noise. Applicants do not show such a filter capacitor.

The transformer (52) in the Voigt patent serves several purposes. First, it functions as an energy storage element, storing energy in the primary winding when the blocking oscillator is on and transferring the stored energy to the output windings when the blocking oscillator is off [col. 1, lines 50-55]. Secondly, it includes a sense winding that is used for output voltage regulation [col. 1, lines 60-63]. Thirdly, the transformer provides isolation between the input and output. Fourthly, the transformer acts as a voltage scaling device, changing the input voltage level to the required output voltage level. Fifthly, by adding several output windings, the transformer can be used for generating several outputs. Note that the isolation and voltage scaling functions are common to all transformers and are not discussed in the Voigt patent. Note also that transformer (52) is a light weight ferrite core device, as dictated by the high switching frequency of the blocking oscillator.

The transformer (106) in applicants' invention has some common functionality with the Voigt transformer (52), namely the isolation, voltage scaling, and the possibility to generate a plurality of outputs by multiple output windings. It is, however, fundamentally different from the Voigt transformer in that it does not act as an energy storage element and it does not include a sense winding for output voltage regulation. Unlike the Voigt transformer, in the preferred embodiment applicants' transformer includes a considerable leakage inductance to implement the linear inductor (101). Furthermore, unlike the Voigt transformer, applicants' transformer is typically a mains-frequency device [page 4, line 1].

The electronic device (68) in the Voigt patent is a single power transistor [col. 3, line 44] that is turned on during the energy storage period of the transformer and is turned off during the transfer of the energy from the primary winding to the secondary windings [col. 1, lines 48-55]. That device carries current only in one direction. In contrast the electronic device (103) in applicants' invention carries current in both direction, i.e., it sinks and sources current [page 2, 3rd line in the Summary], it generates a phase-shifted AC voltage at one end of the loss free impedance [page 4, paragraph 3], and it is implemented either as a mosfet bridge, a push-pull circuit, or other functionally similar configurations.

The rectifier (30) in the Voigt patent converts the unregulated AC mains voltage into a DC voltage to feed the self-oscillating converter. There is no such rectifier in applicant's invention, which is aimed at regulating the AC voltage for the load. The purpose of the output capacitors (210, 224, 232, 242, etc.) in the Voigt patent is to filter the output voltages. In applicants' invention a fundamental function of the output capacitor (104) is to serve as an energy storage to enable the regulating bridge to both sink and source current.

Applicants would also like to point out that the power supply described in their application has the inherent capability of both sourcing and sinking currents [page 2, 3rd line in the Summary], which is an important advantage, for example in applications where the load is a DC electric motor. The current sinking capability allows the production of a braking torque for the motor, while returning the excess power to the power source. Voigt's invention has no possibility to quickly discharge the output capacitors or return any superfluous power to the power source. Instead such power must be dissipated in the circuit.

Comment on the Cited Koenig Patent

Unlike applicants' invention the Koenig patent (5,768,368) is aimed at the distribution and conditioning of low-power telecommunication signals, in particular the ringing voltage. The Koenig patent mentions an unbalanced current source and current sink block (100) [sheet 2], which is essentially the combination of two lossy current regulators and a battery (as shown in Figure 2 of the patent). That block is, however, completely different from the lossless controllable electronic device (103) of applicants' invention, including both its function and implementation.

Conclusion and Request

Applicants proved that the invention cannot be anticipated by the Voigt et al. patent (4,092,709), because that patent discusses a fundamentally different structure, and the elements in that patent have different functions. Thus the rejection of the claims 1-5 and 17 on the basis of that patent is overcome. Accordingly, Applicants submit that all claims of the amended application are now in full condition for allowance, which action Applicants respectfully solicit.

Very respectfully,

Carl O. Olsson
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CH-1726 Farvagny
Switzerland

CERTIFICATE OF MAILING

I hereby certify that this correspondence will be deposited with the Swiss Post by Priority Mail, postage prepaid , in an envelope addressed to Commissioner of Patents, Box 1450, Alexandria, Virginia 22313-1450, on the date below.

Date: JAN 16 2008

Inventor's signature: